

STRUCTURE 8

This structure is a pumping station with a gated spillway, which can control flows that bypass the pumps. The structure is located in the alignment of the Miami Canal at its intersection by Levees 4, 5, and 23, about 30 miles southwest of the town of Belle Glade and 15 miles west of U.S. Highway 27 at the Palm Beach-Broward County line. The pumping station is constructed of reinforced concrete and concrete block masonry superstructure with four (4) Fairbanks Morse 152 inch diameter horizontal pumps rated for 1040 c.f.s. at 4.5 foot static head. Each pump unit is driven by a Fairbanks Morse model 38D8-1/8, 800 horsepower, opposed piston, diesel engine connected to pump through a HY-VO type two-stage chain transmission manufactured by Morse Chain Company. Priming of the main pumps is accomplished by an electrical motor-driven Nash model K-6, 600 C.F.M. vacuum pump. Power for the station is furnished by two 150 KW 6-71 Detroit Diesels, Model No. 10637305 diesel engine-generators. A 15-ton manually-operated overhead bridge crane within the superstructure and a 20-ton double leg Falcon Engineering Company motor-operated outside gantry crane are provided for general service and maintenance. Other services at the station provide a station service water system for washdown, a dewatering system for the intake bays for inspection and maintenance, and a rail-mounted trash machine for removing debris from the intake bay trash rack.

PURPOSE

The purpose of the structure is to discharge excess drainage water via the Miami Canal, from the agricultural area north of the pumping station, into Conservation Area No. 3 at the rate of 3/4 inch per day from the 208 sq. mile tributary drainage area.

OPERATION

The pumping station will be operated whenever the water level in the Miami Canal within the agricultural area tributary to the pumping station exceeds 12.5 ft., unless the water level in the conservation area is low enough to permit gravity discharge at a satisfactory rate through the adjacent spillway gate. The water surface should not be drawn down below 10.0' at the pumping station. The pumps should be started and stopped slowly, one pump at a time, so that the high velocities and surges will not occur in the canal.

Revised 3/19/02

The Operation Chart defines the entire recommended range over which pumping can be accomplished. Inasmuch as the reduction ratio between engine and pump is fixed, all pump rotative speeds are expressed in terms of engine speeds which are indicated on the engine tachometer. The rated speed is 707 r.p.m. At this speed, each pump has a design capacity of 1040 c.f.s., or greater, with pool to pool heads not in excess of 4.5 feet and intake pool gauge between El. 12.0 and 9.0.

If, during a pumping operation, the water surface on the intake bay falls below El. 10.0, the speed of all pumps then operating should be reduced to not less than 646 r.p.m. If this does not restore the water surface in the intake pool elevation to 10.0, one or more of the pumping units should be shut down until the minimum pool elevation is re-established.

The pumps in this station are designed to pump drainage water containing a negligible amount of sediment or other material which might damage the surface of the pump or the bearings. All pump bearings are designed for grease lubrication and to exclude dirt and grit. However, the quantity of water being pumped by the station should be reduced at any time the water in the suction bay becomes moderately silted or if it appears that the approach velocities are carrying a bottom load of sand into the sump chambers.

The main pumping units at Station 8 are considered to be free from severe or harmful criticals through the speed range zero to 707 r.p.m. There are, however, minor criticals at 288 r.p.m. and 444 r.p.m. and these speeds are to be avoided in the starting up and slowing down phases.

The gate at S-8 can release water from the Miami Canal into WCA 3A or from WCA 3A into the Miami Canal, as needed.

FLOOD DISCHARGE CHARACTERISTICS

	Pump Design	Gravity Design
Discharge Rate	<u>4170</u> cfs	<u>500</u> cfs
	* <u> </u> % SPF	* <u> </u> % SPF
Headwater Elevation	<u>12.0</u> feet	<u>12.0</u> feet
Tailwater Elevation	<u>16.5</u> feet	<u>11.9</u> feet
Type Discharge	<u>Pumped</u>	<u>submerged uncontrolled</u>

*Design flow not related to Standard Project Flood

Revised 3/19/02

DESCRIPTION OF STRUCTURE

Type Four pumping units and one gated box culvert spillway in a reinforced concrete and concrete block structure

Spillway

Number of barrels one

Size of barrels 16.5' wide by 14.4' high

Length of barrels 78½ feet

Gate sill elevation 1.0 feet

Culvert invert 0.1 feet

Clear gate opening 12.0 ft. high by 16.5 ft. wide

Gates

Number One

Type vertical lift

Size 12.4 ft. high by 17.25 feet wide

Control On-site manual and remote computer control

Lifting Mechanism direct drive electric motor gear connected to gate stem lifts

Maximum Gate Opening 11.0 feet

Dewatering Facilities

Storage On-site

Type Stop logs

Size and Number

Upstream & Downstream 27 each, total

14" x 14" x 17'-10" long

Pumping Station

Number of Pumps 4

Size and Type of Pumps 152" horizontal propeller

Design rating 1040 c.f.s. each

Impeller speed 67 r.p.m.

Revised 3/19/02

Pump Manufacturer Fairbanks Morse

Engine Make & Type Fairbanks Morse, 5-cylinder, opposed piston diesel

Engine Horsepower 895 each

Engine speed 707 r.p.m.

Gates (per bay)

Number 1

Location downstream end of discharge line

Type vertical lift with flap gates

Size 20'-9" wide by 10'-5" high

Control manual

Lifting Mechanism direct drive electric motor gear connected to lift stems

Dewatering Facilities (per bay)

Storage On-site

Type bulkhead gates

Size & Number (Upstream & Downstream)

Number 5

Width 1' -9"

Height 3' -6"

Length 27' -1"

Date of Transfer: February 9, 1962

ACCESS: Via access road on west side of Miami Canal from South Bay

HYDRAULIC AND HYDROLOGIC MEASUREMENTS

Water Level On-site, analog and remote digital headwater &
tailwater recorders

Gate Position Recorder - On-site analog and remote digital recorder

Rain Gauge: Remote, digital recorder

Engine Tachometers: Digital, on-site and remote

Revised 3/19/02

POWER SOURCE	Prime Movers:	<u>Diesel engine</u>
	Station Power:	Normal: <u>Commercial electricity</u>
		Emergency: <u>Diesel engine driven electric generator</u>